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FIG. 5.—Transverse section through the head, showing the invagination and thickening of the epiblast to form the brain; *my*, myeloid substance of the ganglion. $\times \frac{1}{5}$ A.

All the longitudinal sections are from the same egg, and the transverse sections from another. The figures were all drawn by the author with the camera.

—*A. S. Packard.*

PHYSIOLOGY.[1]

SCIENCE VS. THE "ZOÖPHILIST."—The believers in physiological experiment upon animals as a means for increasing our knowledge of the body will all heartily indorse Professor Martin in his vigorous "castigation" of the truth-distorting and fanatic *Zoöphilist*, an English sheet whose ostensible object is the prevention of cruelty toward animals. People who are opposed to what is popularly known as "vivisection," may be divided into two classes, the reasonable and the unreasonable. It is the duty of physiologists to maintain the respect of the former class by the presentation of the abundant arguments which defend the use of the lower animals, under proper conditions, for scientific purposes. The latter class could probably never be completely silenced except by a course of unresponsive contempt, but for all that one must occasionally be pleased to see a fool get his just deserts.

CONDITIONS MODIFYING THE DIASTATIC ACTION OF SALIVA.—Messrs. Chittenden and Smith have extended the valuable researches of the former upon the diastatic action of saliva. The following are their conclusions:

"1. The diastatic action of saliva can be taken as a definite measure of the amount of ferment present only when the dilution of the saliva in the digestive mixture is as 1 : 50 or 100. The limit of dilution at which decisive diastatic action will manifest itself with formation of reducing bodies is 1 : 2000–3000, under the conditions previously given. 2. The diastatic action of neutralized saliva is greater than that of normally alkaline saliva. The difference is particularly noticeable where the dilution is as 1 : 50 or 100, and is apparently out of all proportion to the amount of alkalinity. 3. Sodium carbonate retards the diastatic action of saliva in proportion to the amount of alkaline carbonate present. The percentage of alkaline carbonate, however, which hinders diastatic action can be designated only for definite mixtures and not in a general sense, being dependent on the dilution of the saliva and the consequent change in percentage of proteid matter. 4. The destructive action of sodium carbonate is materially modified by the dilution of the saliva, becoming greater the more the fluid is diluted. This result is due not to simple dilution but doubtless to the diminished amount of proteids. 5. Neutral peptone has a direct stimulating effect on the diastatic action of neutral saliva. 6. The presence of small percentages of neutral peptone tends to raise the diastatic action of normally alkaline saliva to a point even beyond the action of the neutralized fluid; due in part doubtless to a loose combination of the alkali with the proteid matter, and also to a direct stimulation of the ferment. Likewise peptone tends to diminish in a similar manner the retarding action of the various percentages of sodium carbonate. To accomplish this, however, the amount of peptone must be proportionate to the percentage of alkaline carbonate. 7. Peptone tends to prevent the destructive action of dilute sodium carbonate on salivary ptyalin, thus giving proof of the probable formation of an alkaline-proteid body. 8. Saliva with its proteid matter saturated with acid appears to have a greater diastatic action than when simply neutralized; except when the acid proteids thus formed are above a certain percentage. Small percentages of peptone saturated with acid similarly increase the diastatic action of neutralized saliva up to a certain point. Increasing the percentage of acid-proteids finally causes a diminution of diastatic activity. 9. The retarding influence of acid-proteids is out of all proportion to their power of destruction. Large percentages, however, of acid-proteids may cause almost complete destruction of the ferment. 10. The most favorable condition for the diastatic action of ptyalin, under most circumstances, appears to be a neutral condition of the fluid together with the presence of more or less proteid matter. The addition of very small amounts of hydrochloric acid, however, to *dilute* solutions of saliva, giving thereby a *small percentage* of acid-proteids, appears to still further increase diastatic action. Under *such conditions* a minute trace of free acid appears to still further increase the action. 11. 0.003 per cent free hydrochloric acid almost completely stops the amylolytic action of ptyalin. The larger the amount of the saturated proteids the more pronounced becomes the retarding action of free acids. 12. The retarding action of the smaller percentages of free acid are not due wholly to destruction of the ferment. Pronounced destruction takes place with 0.005–0.010 per cent free hydrochloric acid. 13. Proteid matter, in influencing the diastatic action of salivary ptyalin, acts not only by combining with acids and alkalies, but apparently also by direct stimulation of the ferment."—*Trans. Conn. Acad., March, 1885.*

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[1] This department is edited by Professor HENRY SEWALL, of Ann Arbor, Mich.

PHYSIOLOGY OF THE SYMPATHETIC NERVES.—The generalization of Dr. Gaskell "On the relationship between the structure and the function of the nerves which innervate the visceral and vascular systems" are of the highest interest and importance. Dr. Gaskell calls attention to the fact that involuntary muscles, visceral and vascular as well as cardiac muscle, are supplied by two kinds of nerve fibers which are histologically distinct, the medullated or white and the non-medullated or gray nerve fibers. Contraction of involuntary muscle is brought about exclusively by impulses proceeding along the non-medullated nerves, while relaxation or inhibition of muscular contraction is as invariably produced by impulses conducted by the medullated nerves. All nerves in their course from the spinal cord to the sympathetic ganglia are of the medullated variety, but on leaving the sympathetic ganglia they are separable into two groups of medullated and non-medullated fibers; the medullated sympathetic fibers are, however, easily distinguished from those of ordinary striated muscle by their smaller diameter.

Dr. Gaskell writes: "In previous communications I have shown that the heart of various cold-blooded animals, *e. g.*, frog, tortoise, crocodile, is innervated by nerves coming from two distinct sources in the same way as the heart of the warm-blooded animal; and I am now enabled to make the further communication that in the dog, cat, rabbit, tortoise and crocodile these two sets of nerve fibers are structurally differentiated from each other in precisely the same manner. The vagus fibers from their origin up to their entrance into the heart are medullated, the sympathetic fibers in the whole of their course from the basal ganglia of the sympathetic along the annulus of Vieussens to the heart are non-medullated. * * * Every involuntary muscle is innervated by two nerves which are histologically and physiologically distinct; the one gray, non-medullated, causing contraction of the muscle; the other white, fine, medullated, causing relaxation of the muscle."—*Jl. of Physiology, Vol. vi, p. iv.*

ANTHROPOLOGY.[1]

THE AMERICAN ANTIQUARIAN.—This valued exchange has now become a bi-monthly. The anthropological papers of No. 5, Vol. VI, are:

Hindoo mythology. By F. G. Fleay.
Dates in the ancient history of S. America. By M. Castaing.
The hill tribes of India. John Avery.
Emblematic mounds. By S. D. Peet.

The paper of Mr. Avery is of great value, not only in naming and describing tribes, but in the explanation of certain customs. The article by the editor relates to the attitudes of the animals in the emblematic mounds, and supports the view that the constructors had in mind the various poses of the animals, which are familiar to hunters.

METALLURGY AMONG SAVAGES.—Dr. Richard Andree has just published in Leipzig a most interesting monograph with the following title: "Die Metalle bei den Naturvölkern mit berücksichtigung prähistorischer verhältnisse, mit 57 abbildungen im text.

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[1] Edited by Professor OTIS T. MASON, National Museum, Washington, D. C.